

REMARKS

Claims 1-4, 6-11, 14 and 16-24 are pending in the present application. Claims 5, 12, 13 and 15 were previously canceled. Claims 1, 3, 9, 17, 20 and 21 have been amended. No new matter has been added. Applicant respectfully requests reconsideration of the claims in view of the following remarks.

Claims 1, 3, 4, 6, 8-10, 14, 16, 17 and 19-24 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sato, *et al.* (U.S. Patent No. 4,827,266, hereinafter "Sato") in view of Johson (U.S. Patent No. 6,236,368, hereinafter "Johson") and claims 2, 7, 11 and 18 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sato, in view of Johson and further in view of Kushihi (U.S. Patent Application Publication No. 2002/0044092, hereinafter "Kushihi"). Applicant respectfully traverses these rejections.

Claim 1 has been amended to recite "a shorting tab electrically connected between the ground plane and the patch antenna, wherein the shorting tab electrically connects to the patch antenna adjacent to a connection point of the feed, the shorting tab performing an impedance transformation." The other independent claims have similar limitations. Applicant respectfully submits that the references of record do not teach or suggest the limitations of the pending claims.

Johson refers to a loop directive antenna but not to patch antennas. Johson's loop antenna may be arranged within a housing. The point of the present invention is not embedding the antenna into a housing but disclosing an antenna that can work in at least two different frequency bands. Thus, Johson is not particularly relevant.

Sato refers to planar antennae with lumped elements between the antenna and a base plate. The lumped elements are realized by discrete components. The purpose of Sato's antenna

is to work in a wide frequency band but not in two different frequency bands. Further, there is no shorting tab – comparable to shorting tab (38) of the present invention – present. Thus, Sato's document is not relevant prior art, too.

Kushihi discloses an LC parallel resonant circuit that is serially connected between a transmission/reception circuit and a planar antenna. Kushihi discloses neither the elements of the LC circuit being directly attached to the patch antenna nor a short table as an additional electrical connection to the antenna. Further, there is no hint for a person skilled in the art to add a short tab performing an impedance conversion according to the present invention.

The present invention provides a planar antenna that has the advantages of a slotted planar antenna without its disadvantages. A *slotted* antenna is perfectly suited to work in two different frequency bands. The combination of the patch antenna and the geometrical form of the slot enables the conducting planar antenna to establish at least two different modes of electromagnetic oscillation having different wave lengths. This feature is equivalent to a good performance when emitting radio frequency signals in two different frequency bands. However, there is a big disadvantage of a slotted planar antenna: User interaction between the antenna's slot and a user (e.g., between the antenna and a user's hand holding the respective mobile communication device) may strongly lead to detuning the antenna.

In the present invention, the inventors found out that a planar antenna without a slot but having a feed tab and a short tab located in the vicinity of the feed tab does – when the feed tab and the short tab are combined with a respective LC circuit as a matching circuit – properly work in different frequency bands – analog to a planar antenna having a slot. But as there is no slot, detrimental interaction between the antenna itself and its environment is strongly decreased.

Neither the feature "short tab," nor the fact that the above described configuration gives rise to a strongly improved antenna performance is disclosed in the cited publications. As a result, the combinations of features of the amended independent claims can not be obvious over the cited art. With an according new set of claims and the respective arguments above, the present invention should be in condition for allowance.

Applicant has made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Ira S. Matsil, Applicant's attorney, at 972-732-1001 so that such issues may be resolved as expeditiously as possible. The Commissioner is hereby authorized to charge any fees that are due, or credit any overpayment, to Deposit Account No. 50-1065.

Respectfully submitted,

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Date



Ira S. Matsil
Attorney for Applicant
Reg. No. 35,272

SLATER & MATSIL, L.L.P.
17950 Preston Rd., Suite 1000
Dallas, Texas 75252
Tel.: 972-732-1001
Fax: 972-732-9218